HY-POWR Jars

HY-POWR jars are designed and manufactured for the severe drilling conditions encountered in vertical, directional and horizontal wells. This jar operates as a double-acting hydraulic jar. BHA recovery and reliable jarring operation is assured with this double-acting hydraulic jars delivering a high impact force when required regardless of position of BHA in vertical, deviated or horizontal wells. **HY-POWR** jars operates using the hydraulic metering delay system for both up-jarring and down-jarring. The magnitude of impact delivered by hydraulic jar is dependent on the magnitude of overpull or slackoff placed on the drillstring provided the maximum jar setting load is not exceeded.

Safety Clamp

JA's drilling jars are delivered to the rig in the open position with safety clamp placed around the exposed chrome area. The safety clamp keeps the jar extended while tripping and transporting. Caution: the safety clamp must be removed on the rig floor before the jar is run in the hole; failure to do so could result in damage to the jar and/or rig. There is also a possibility of down hole damages up to and including fishing operations.

Tripping in: After the jar is made up into the drill string and just before the jar is run through the rotary table, simply remove jar safety clamp and store on rig floor. Please handle safety clamp properly as there are charges for damage or loss.

Tripping out: Once the jar passes through the rotary table install the safety clamp onto the chrome area of the jar mandrel, then close, lock and insert safety pin. It is now safe to rack the jar back in the derrick without concern of the jar closing.

Hydraulic Jar Operation

Tension Placement

Jarring Up

When the hydraulic jar is placed in tension or above neutral point, the jar will be in the open or fully extended position. Therefore the jar will have to be cocked down before it can be fired up. To cock down the jar, simply slack off a small amount of weight above the jar or until 10" of free down travel is observed. At this point the jar is cocked and ready to be fired either up or down. To jar up, simply pull the desired amount of overpull above string weight and jar will fire after the time delay specified in the tables below.

Caution: Do not exceed the overpull limit listed per jar size for each jar type in the jar specifications table below.

Jarring Down

When the hydraulic jar is placed in tension or above the neutral point, simply slack off weight above the jar until 10" of free down travel is observed. The jar is now in the cocked position and can be fired up or down. In order to fire down simply slack off desired amount of weight above the jar and wait for the time delay specified in the tables below for each jar type. At this point, the jar will fire down. To re-cock the jar, simply pull up and observe the 10" of free up travel and the jar will be in the cocked position once again and ready to fire either direction.

Compression Placement

Jarring Up

When jar is placed in compression or below the neutral point the jar will be closed when ready to fire. To fire up simply pull drill string; the jar will travel up 10" to the cocked position. At this point pull the desired amount of over pull above string weight and jar will fire after the amount of time delay specified in the tables below.

Caution: Do not exceed the overpull limit listed per jar size for each jar type in the jar specifications table below.

Jarring Down

When jar is placed in compression or below the neutral point and a down impact is desired simply pick up string weight above the jar plus additional drag. At this point the jar will be in the cocked position and ready to fire either direction. To hit down simply slack off weight above the jar and wait for the time specified in the tables below.

Note: Over pull, weight available above the jar, stretch of string and placement will determine the force of impact up. Weight available above the jar and placement alone will determine the amount of impact force down. Whereas, down hole drag, deviation, lack of weight and placement of the jar can detract from the amount of impact force in either direction.

	Jarring Force	6-1/2"	8"
Hydraulic Delay	UP 100,000lbs	30-180 secs	30-180 secs
	DOWN 100,000lbs	30-180 secs	30-180 secs

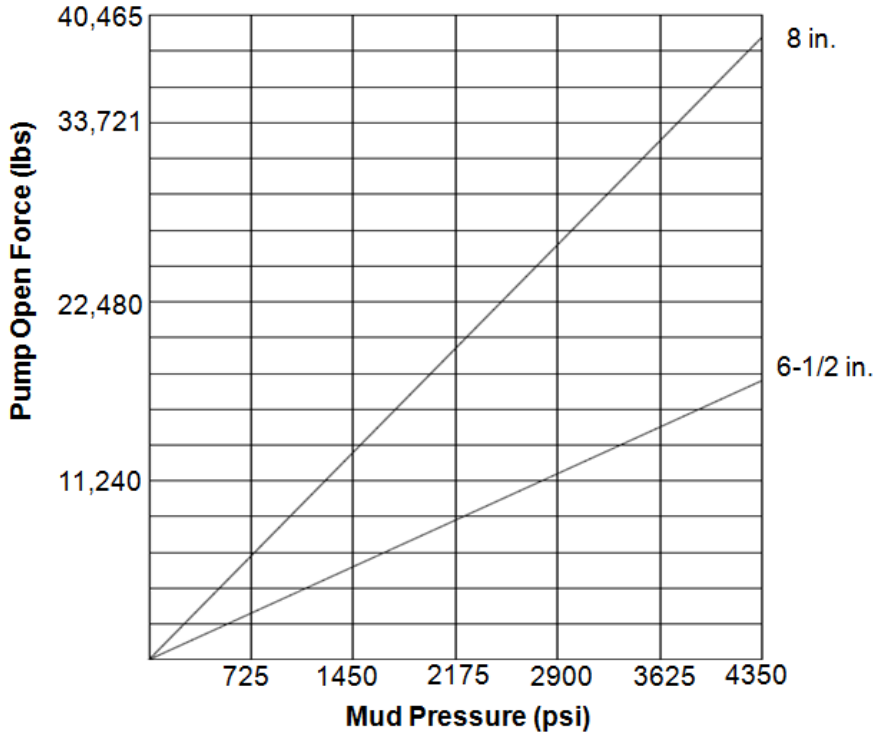
Specifications

Tool OD (in)	6-1/2"	8"
Bore I.D (in)	2.72	3
API Connection	NC50/NC46	6-5/8 REG/NC56
Overall Length (ft)	31	32
Total Weight (lbs)	2,249	3,660
Up Jarring Free Stroke (in)	7.5	7.5
Down Jarring Free Stroke (in)	7.5	7.5
Maximum Tensile Load (lbf)	843,034	1,494,979
Yield Torque (ft/lbf)	55,317	98,096
Pump Open Area (sq.in)	4.03	9
Maximum Overpull (lbf)	157,366	224,809
Maximum temperature (F/C)	298/148	298/148

Pump Open Force (POF)

Pump pressure generates a force called the Pump Open Force (POF) within the jar as a result of the differential pressure between the bore of the jar and the annulus during circulation of drilling fluid. During up-jarring, POF enhances tool opening action (increasing the ease of opening jar lock and hydraulic metering valve) and increases impact. However, POF makes it difficult to cock the jar in preparation for up-jarring. During down-jarring, POF hinders tool opening action (by keeping the tool in the open position) and decreases impact. However, POF aids cocking the jar in preparation for down-jarring. For calculations please refer to Pump Open Force chart.

It is recommended to adjust circulation accordingly depending on up/down-jarring and cocking up and down to control the pump open force.



Typical Up-jarring Calculation (units in lbs)	
Pick-Up Weight before Up-jarring (Total indicator reading: drillstring, block, hook, swivel)	220,000
Estimated BHA weight below jar	42,000
Weight above jar	178,000
Desired Up-jar force (Overpull)	80,000
Load indicator reading before adjustment	258,000
Pump open force effect	13,000
Hole drag effect	20,000
Weight Indicator reading for tripping jar upward	265,000
Increase weight load indicator reading from 178,00 to 265,000 to produce 80,000 up jar force	

Typical Down-jarring Calculation	
Slack-off Weight before Down-jarring (Total indicator reading: drillstring, block, hook, swivel)	220,000
Estimated BHA weight below jar	42,000
Weight above jar	178,000
Desired Down-jar force (down-jar setting)	80,000
Load indicator reading before adjustment	98,000
Pump open force effect	13,000
Hole drag effect	20,000
Weight Indicator reading for tripping jar upward	65,000
Decrease weight load indicator reading from 178,00 to 65,000 to produce 80,000 down jar force	